

Modeling the Interaction of Actors in the Private Educational Cloud

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Abstract

The article considers the interactions involved in the educational process with the use of the private cloud simulated using CASE-technology, and features solutions are formulated technological and methodological requirements for the solution.

Keywords

Modelling; Private Cloud; Education Network

Introduction

Due to the rapid development of ICT, their introduction in educational process and management of university, there is an obvious interaction problem among establishments of professional education, participants of educational process and the organizations employers. The solution of this problem demands active development of interaction of educational institutions for expansion of availability of educational services, granting to consumers of these services such as various educational programs, technologies and tools of training, involvement and transfer into uniform educational space of information resources of educational institutions of all levels, expansion of educational space at the expense of requirements to receive competence from business and society. Formation at educational institutions public assessment's mechanisms of activity's results and their reflection in a mode of free access using information resources is also important.

At the same time, there is no scientifically reasonable approach for the solution of the put problem. It is required creation of methodical bases of such approach including carrying out the system analysis, development of techniques of information modeling of interaction of educational space's subjects, development of tools of interaction's support and technology of their application. Approach to the solution of this problem by the way of development of virtual information environments with use of models

of cloudy technologies and crowdsourcing, and also carrying out the analysis of an educational network's content is reasonable.

In this case it is possible to gain the greatest synergetic effect by uniting on one platform the models of social computing and a crowdsourcing (collective reason) for the solution of educational tasks at the level of the uniform information and educational environment. Creation and expansion of a private educational cloud can be optimum approach in this case.

Private Cloud

The private cloud is created on the basis of its own IT infrastructure for optimization of its use within the educational institution or the company.

As a rule, large providers develop cloud computing in data-processing centers (DPC). The concept of cloud computing unites in itself such known models and technologies as Computing On-Demand, Utility Computing, Grid computing, are granting various elements of information system in the form of service.

Advantages of application of cloud computing to educational institutions, first of all, in possibility of transition to continuous formation of the format "study everywhere and always": technologies of cloud computing allow students to have access to their personally adjusted working environment always in a mode 24x7x365 and irrespective of a territorial arrangement from any available devices (personal computer, laptop, PDA, etc.) in case of availability of access to the Internet. As an important advantage of application of cloud computing, a number of authors note decrease in costs for the personnel. At the expense of transfer of part of services in a cloud, the number of the IT personnel of educational institution decreases, the need for improvement of knowledge of experts in the narrow specialized software product and, therefore, for professional development of employees in the field

disappears.

The Main Objectives in the Design and Development of Private Educational Cloud

In this regard development of scientific and methodical bases and information modeling of virtual interaction of information's subjects and educational space of University with use of the advanced ICT based on cloudy technologies is actual.

Main objectives in the field:

- System analysis of a problem of interaction of information's subjects and educational environment.
- Analysis of modern approaches to information modeling, tools of their support and choice of approaches which are most adequate to the put problem.
- Collecting and system analysis of information about establishments of professional education and potential employers, creation of a repository of competences.
- Development of technique of information model's creation of network interaction of information's subjects and educational space as sets of methodics of creation of information's subjects models with use of notations of modeling and CASE technologies.
- Definition of basic components of tool support of virtual interaction of information's subjects and educational space of University, their design and realization.
- Analysis of content of private educational cloud on the basis of social monitoring, identification of mediators of the content and forecasting of requirements for special professional competences of trainees.

Social Computing and Trends in ICT Development

As analysts of Gartner consider, the main tone in the next years in the market of IT technologies will be set by developing social networks, mobile communication and cloudy technologies. Putting serious pressure upon the enterprises worldwide, these technologies will cardinally change existing business models and business processes, opening new spheres for competition and offering new threats to business. As

regardless of the work sphere, the enterprises should react somehow to new introductions at competitors and partners, indirectly, but inevitably, the listed technologies will make impact on branches adjacent to IT as well, and even on those spheres which, apparently, have to IT no relation.

As experts note: in the XIX century companies scooped human resources in their own staff (Insourcing), in the XX century – in the staff of the companies-counteractors (Outsourcing), in XXI – in the global Network (Crowdsourcing).

The network generates unusual effects which didn't exist earlier. Today these effects not only are more and more actively used by business, but also rapidly change its nature. First, today masses of people participate in various network projects for a small payment or even free of charge if consider this project interesting to itself and useful to society (crowdsourcing). Secondly, more and more people prefer to solve the problems, passing traditional state, public and business institutes – through communication and cooperation with other people (groundswell). These are two trends which form a basis of social computing as a new way of production of knowledge.

Realization of crowdsourcing is most effective in appendices of social computing – Idea Management. Today the most popular functional capabilities of foreign systems are of the class of Idea Management:

- assessing and ranging of ideas and their variants, their structurization, indication of communications between them, subscription to updating of ideas;
- organization of brain storms, meetings, closed groups, support of intellect- maps, integration with knowledge bases and other appendices of the company, opportunity "on the run" to place an idea in the system using mobile phone;
- financial assessment of ideas, tracking results of their introduction, material and moral motivation of authors of ideas, etc.

Examples of Enterprise Social Networking:

- Social Networks.
- Social Media.
- Social Computing.
- Social Information Processing
- Social Networking Services.
- Enterprise Social Computing.

Model of Interaction between Involved in the Educational Process in the Private Cloud

The main content of works in this direction: development of models of the private educational cloud, system analysis with use of information modeling and modern CASE means of interaction between participants of information and the educational process with use of cloudy technologies, analysis of content of the private educational cloud, forecasting of high-quality and quantitative changes of structure of working personnels and requirements to professional competences the basis of which are indicators of requirements of employers to quality of training of specialists and international standards in the field of ICT (The European frame of competences e-CF).

Main requirements to modeling: use of modern tools for the automated creation of information models, methodologies of information modeling for the system analysis of a problem of interaction of subjects, content analysis of self-organizing network communities.

For the analysis of processes of interaction in the private educational cloud and its structure it was decided to use business models meeting norms of international standards of the ISO 9000:2000 series, architecture of ARIS and tool means of ARIS Toolset.

The chart of precedents for the created decision is given in fig. 1.

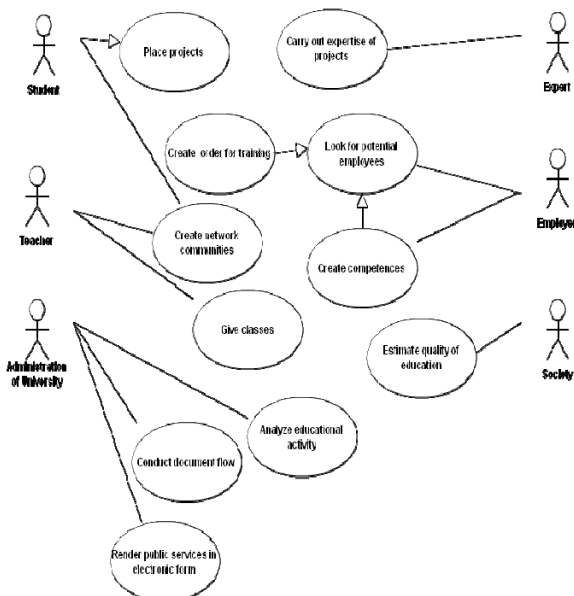


FIG. 1 DIAGRAM OF PRECEDENTS OF PRIVATE EDUCATIONAL CLOUD

On the basis of the semantic UML models and requirements to an educational network diagrams of

the purposes of decision were developed, and also modeling of organization view which shows interaction of users and organizational units, as well as their communications and (relevant) structures having relation to them and function view containing the description of carried-out functions, list of separate subfunctions, and also existing general interrelations and subordination communications which exist between functions is carried out.

The model of the Organizational Chart is used in ARIS for the description of organizational hierarchy of performers of functions of business processes (officials, subjects of educational network).

The model of the Value Added Chain Diagram represents business process in the form of functions participating at creation of a value added (quantity, quality). Each function has specification, i.e. is revealed in the form of extended Event Driven Process Chain.

The diagram of purposes for the created decision is given in fig. 2.

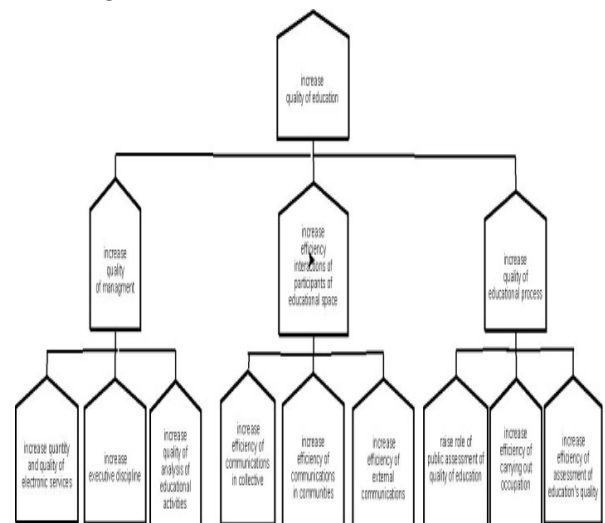


FIG. 2 DIAGRAM OF PURPOSES

We have identified the main business processes that are implemented in the private educational cloud (see fig. 3). For each business process is built EEPC (extended event-driven process chain).

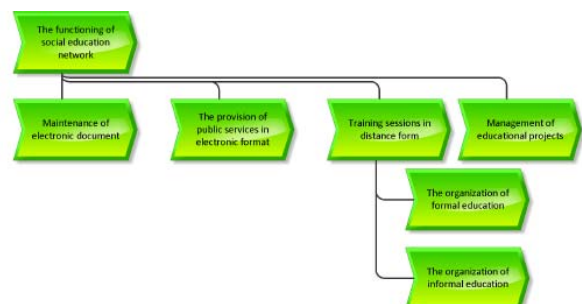


FIG.3 PROCESS LANDSCAPE

An example of the process of Management of educational projects sees below (fig. 4).



FIG.4 BUSINESS PROCESS "MANAGEMENT OF EDUCATIONAL PROJECTS"

Management of educational projects is implementing tasks:

- The organization of non-formal and informal education.
- Work in project teams.
- Create a portfolio of projects.
- Solution of internal problems.
- Monetizing development.

Alternative solution is working in the private educational cloud: the distance learning system (LMS, LCMS) social networks and specialized portal.

The road map of VMWare company is taken for a basis of technique of design and assessment of the private educational cloud. (fig. 5.)

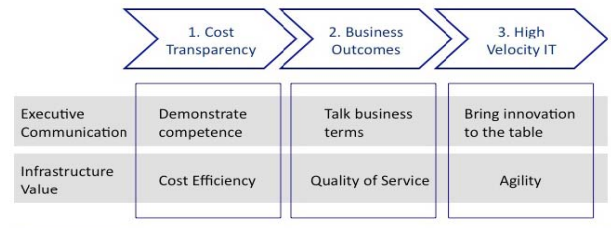


FIG. 5 IT VALUE TRANSFORMATION ROADMAP

Conclusion

The main methodological and technological aspects of functioning of the proposed solution:

- availability of educational resources in a mode 24*7, realization of possibility of training in a continuous mode with use of various means of access to educational resources;
- development and support of system of ratings for assessment of educational and administrative activity's results;
- support of mechanisms of public assessment of educational activity's results as an establishment in a whole, and a certain individual in particular;
- information transparency of education process;
- binding to system of KPI for assessment of efficiency of system's functioning as a whole and its separate components;
- socialization of trainees, support of social groups of users, design teams and temporary creative collectives;
- support of instruments of spontaneous and informal education;
- support of templates and versions of documents, tracking the status of documents;
- use of technology of crowdsourcing at the solution of educational and other tasks;
- possibility of introduction of Social Information Processing.

Productivity of decision's work should be estimated on the basis: existence of development of methodical recommendations for all participants of virtual interaction, analysis of efficiency of realized education programs, volume of modernization of system of competences of experts on the basis of requirements of business and society, analysis of efficiency of use of crowdsourcing at the solution of professional tasks on inquiries.

Performance criteria of the solution include:

- the number of completed projects;

- Work on the project;
- rating of Project in a social network;
- percent coverage of student project work;
- percent of projects with satisfaction of the client.

Criteria may be part of a total KPI University.

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Eugene E. Kovalev was born in Mogilev, Belarus 11 June 1974. In 1996 he graduated from the Faculty of Technical Cybernetics, Vladimir State University, "Robotic systems and complexes". Since 2002 he worked as a teacher at the Sholokhov Moscow State University for the

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